



#6

SEQUENCE LISTING

<110> EDWARDS, ROBERT
BELLOCCHIO, ELIZABETH
FREMEAU, ROBERT
REIMER, RICHARD

<120> NOVEL GLUTAMATE TRANSPORTERS

<130> 305T-932610US

<140> US 09/915,181

<141> 2001-07-24

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<151> 2000-07-25

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<170> PatentIn version 3.0

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| Val | Gly | Asp | Ser | Leu | Gly | Ile | Leu | Gln | Arg | Lys | Leu | Asp | Gly | Thr | Asn |
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| Glu | Glu | Gly | Asp | Ala | Ile | Glu | Leu | Ser | Glu | Glu | Gly | Arg | Pro | Val | Gln |
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| Pro | Lys | Arg | Tyr | Ile | Ile | Ala | Val | Met | Ser | Gly | Leu | Gly | Phe | Cys | Ile |
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| Ser | Phe | Gly | Ile | Arg | Cys | Asn | Leu | Gly | Val | Ala | Ile | Val | Glu | Met | Val |
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| Asn | Asn | Ser | Thr | Val | Tyr | Val | Asp | Gly | Lys | Pro | Glu | Ile | Gln | Thr | Ala |
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| Gln | Phe | Asn | Trp | Asp | Pro | Glu | Thr | Val | Gly | Arg | Ala | Asn | Ser | Leu | Ile |
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| His | Gly | Ser | Phe | Phe | Trp | Gly | Tyr | Ile | Val | Thr | Gln | Ile | Pro | Gly | Gly |
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| Phe | Leu | Thr | Ser | Thr | Leu | Asn | Met | Phe | Ile | Pro | Ser | Ala | Ala | Arg | Val |
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| His | Tyr | Gly | Cys | Val | Met | Cys | Val | Arg | Ile | Leu | Gln | Gly | Leu | Val | Glu |
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| Gly | Glu | Gly | Ala | Asn | Leu | Ala | Ser | Leu | Ser | Lys | Phe | Asn | Thr | Pro | Trp | |
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| Tyr | Phe | Glu | Glu | Val | Phe | Gly | Phe | Ala | Ile | Ser | Lys | Val | Gly | Leu | Leu | |
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| Ser | Ala | Val | Pro | His | Met | Val | Met | Thr | Ile | Val | Val | Pro | Ile | Gly | Gly | |
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| Leu | Val | Leu | Ala | Val | Gly | Phe | Ser | Gly | Phe | Ala | Ile | Ser | Gly | Phe | Asn | |
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| Lys | Lys | Gln | Asp | Asn | Arg | Glu | Thr | Ile | Glu | Leu | Thr | Glu | Asp | Gly | Lys | |
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| Pro | Leu | Glu | Val | Pro | Glu | Lys | Lys | Ala | Pro | Leu | Cys | Asp | Cys | Thr | Cys | |
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| Phe | Gly | Leu | Pro | Arg | Arg | Tyr | Ile | Ile | Ala | Ile | Met | Ser | Gly | Leu | Gly | |
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| Phe | Cys | Ile | Ser | Phe | Gly | Ile | Arg | Cys | Asn | Leu | Gly | Val | Ala | Ile | Val | |
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| Glu | Lys | Ala | Lys | Phe | Asn | Trp | Asp | Pro | Glu | Thr | Val | Gly | Met | Ile | His | |
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 Leu Ile Ala Ala Leu Val His Tyr Gly Gly Val Ile Phe Tyr Ala Leu
 485 490 495
 Phe Ala Ser Gly Glu Lys Gln Pro Trp Ala Asp Pro Glu Glu Thr Ser
 500 505 510
 Glu Glu Lys Cys Gly Phe Ile His Glu Asp Glu Leu Asp Glu Glu Thr
 515 520 525
 Gly Asp Ile Thr Gln Asn Tyr Ile Asn Tyr Gly Thr Thr Lys Ser Tyr
 530 535 540
 Gly Ala Thr Ser Gln Glu Asn Gly Gly Trp Pro Asn Gly Trp Glu Lys
 545 550 555 560
 Lys Glu Glu Phe Val Gln Glu Ser Ala Gln Asp Ala Tyr Ser Tyr Lys
 565 570 575

Asp Arg Asp Asp Tyr Ser
580

<210> 5
<211> 560
<212> PRT
<213> Rattus rattus

<400> 5

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Met | Glu | Phe | Arg | Gln | Glu | Glu | Phe | Arg | Lys | Leu | Ala | Gly | Arg | Ala | Leu | |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | | |
| Gly | Arg | Leu | His | Arg | Leu | Leu | Glu | Lys | Arg | Gln | Glu | Gly | Ala | Glu | Thr | |
| | | | 20 | | | | | 25 | | | | | 30 | | | |
| Leu | Glu | Leu | Ser | Ala | Asp | Gly | Arg | Pro | Val | Thr | Thr | His | Thr | Arg | Asp | |
| | | 35 | | | | | 40 | | | | | 45 | | | | |
| Pro | Pro | Val | Val | Asp | Cys | Thr | Cys | Phe | Gly | Leu | Pro | Arg | Arg | Tyr | Ile | |
| | 50 | | | | | 55 | | | | | 60 | | | | | |
| Ile | Ala | Ile | Met | Ser | Gly | Leu | Gly | Phe | Cys | Ile | Ser | Phe | Gly | Ile | Arg | |
| 65 | | | | | 70 | | | | | 75 | | | | | 80 | |
| Cys | Asn | Leu | Gly | Val | Ala | Ile | Val | Ser | Met | Val | Asn | Asn | Ser | Thr | Thr | |
| | | | | 85 | | | | | 90 | | | | | 95 | | |
| His | Arg | Gly | Gly | His | Val | Val | Val | Gln | Lys | Ala | Gln | Phe | Asn | Trp | Asp | |
| | | | 100 | | | | | 105 | | | | | 110 | | | |
| Pro | Glu | Thr | Val | Gly | Leu | Ile | His | Gly | Ser | Phe | Phe | Trp | Gly | Tyr | Ile | |
| | | 115 | | | | | 120 | | | | | 125 | | | | |
| Val | Thr | Gln | Ile | Pro | Gly | Gly | Phe | Ile | Cys | Gln | Lys | Phe | Ala | Ala | Asn | |
| | 130 | | | | | 135 | | | | | 140 | | | | | |
| Arg | Val | Phe | Gly | Phe | Ala | Ile | Val | Ala | Thr | Ser | Thr | Leu | Asn | Met | Leu | |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 | |
| Ile | Pro | Ser | Ala | Ala | Arg | Val | His | Tyr | Gly | Cys | Val | Ile | Phe | Val | Arg | |
| | | | 165 | | | | | | 170 | | | | | 175 | | |
| Ile | Leu | Gln | Gly | Leu | Val | Glu | Gly | Val | Thr | Tyr | Pro | Ala | Cys | His | Gly | |
| | | 180 | | | | | 185 | | | | | | 190 | | | |
| Ile | Trp | Ser | Lys | Trp | Ala | Pro | Pro | Leu | Glu | Arg | Ser | Arg | Leu | Ala | Thr | |
| | | 195 | | | | 200 | | | | | | 205 | | | | |
| Thr | Ala | Phe | Cys | Gly | Ser | Tyr | Ala | Gly | Ala | Val | Val | Ala | Met | Pro | Leu | |
| | 210 | | | | | 215 | | | | | 220 | | | | | |
| Ala | Gly | Val | Leu | Val | Gln | Tyr | Ser | Gly | Trp | Ser | Ser | Val | Phe | Tyr | Val | |
| 225 | | | | | 230 | | | | | 235 | | | | | 240 | |

Tyr Gly Ser Phe Gly Ile Phe Trp Tyr Leu Phe Trp Leu Leu Val Ser
 245 250 255
 Tyr Glu Ser Pro Ala Leu His Pro Ser Ile Ser Glu Glu Glu Arg Lys
 260 265 270
 Tyr Ile Glu Asp Ala Ile Gly Glu Ser Ala Lys Leu Met Asn Pro Val
 275 280 285
 Thr Lys Phe Asn Thr Pro Trp Arg Arg Phe Phe Thr Ser Met Pro Val
 290 295 300
 Tyr Ala Ile Ile Val Ala Asn Phe Cys Arg Ser Trp Thr Phe Tyr Leu
 305 310 315 320
 Leu Leu Ile Ser Gln Pro Ala Tyr Phe Glu Glu Val Phe Gly Phe Glu
 325 330 335
 Ile Ser Lys Val Gly Leu Val Ser Ala Leu Pro His Leu Val Met Thr
 340 345 350
 Ile Ile Val Pro Ile Gly Gly Gln Ile Ala Asp Phe Leu Arg Ser Arg
 355 360 365
 His Ile Met Ser Thr Thr Asn Val Arg Lys Leu Met Asn Cys Gly Gly
 370 375 380
 Phe Gly Met Glu Ala Thr Leu Leu Leu Val Val Gly Tyr Ser His Ser
 385 390 395 400
 Lys Gly Val Ala Ile Ser Phe Leu Val Leu Ala Val Gly Phe Ser Gly
 405 410 415
 Phe Ala Ile Ser Gly Phe Asn Val Asn His Leu Asp Ile Ala Pro Arg
 420 425 430
 Tyr Ala Ser Ile Leu Met Gly Ile Ser Asn Gly Val Gly Thr Leu Ser
 435 440 445
 Gly Met Val Cys Pro Ile Ile Val Gly Ala Met Thr Lys His Lys Thr
 450 455 460
 Arg Glu Glu Trp Gln Tyr Val Phe Leu Ile Ala Ser Leu Val His Tyr
 465 470 475 480
 Gly Gly Val Ile Phe Tyr Gly Val Phe Ala Ser Gly Glu Lys Gln Pro
 485 490 495
 Trp Ala Glu Pro Glu Glu Met Ser Glu Glu Lys Cys Gly Phe Val Gly
 500 505 510
 His Asp Gln Leu Ala Gly Ser Asp Glu Ser Glu Met Glu Asp Glu Val
 515 520 525
 Glu Pro Pro Gly Ala Pro Pro Ala Pro Pro Pro Ser Tyr Gly Ala Thr
 530 535 540

His Ser Thr Val Gln Pro Pro Arg Pro Pro Pro Pro Val Arg Asp Tyr
 545 550 555 560

<210> 6
 <211> 563
 <212> PRT
 <213> Caenorhabditis elegans

<400> 6

Met Val Gly Glu Pro Leu Ala Lys Met Thr Ala Ala Ala Ala Ser Ala
 1 5 10 15

Thr Gly Ala Ala Pro Pro Gln Gln Met Gln Glu Glu Gly Asn Glu Asn
 20 25 30

Pro Met Gln Met His Ser Asn Lys Val Leu Gln Val Met Glu Gln Thr
 35 40 45

Trp Ile Gly Lys Cys Arg Lys Arg Trp Leu Leu Ala Ile Leu Ala Asn
 50 55 60

Met Gly Phe Met Ile Ser Phe Gly Ile Arg Cys Asn Phe Gly Ala Ala
 65 70 75 80

Lys Thr His Met Tyr Lys Asn Tyr Thr Asp Pro Tyr Gly Lys Val His
 85 90 95

Met His Glu Phe Asn Trp Thr Ile Asp Glu Leu Ser Val Met Glu Ser
 100 105 110

Ser Tyr Phe Tyr Gly Tyr Leu Val Thr Gln Ile Pro Ala Gly Phe Leu
 115 120 125

Ala Ala Lys Phe Pro Pro Asn Lys Leu Phe Gly Phe Gly Ile Gly Val
 130 135 140

Gly Ala Phe Leu Asn Ile Leu Leu Pro Tyr Gly Phe Lys Val Lys Ser
 145 150 155 160

Asp Tyr Leu Val Ala Phe Ile Gln Ile Thr Gln Gly Leu Val Gln Gly
 165 170 175

Val Cys Tyr Pro Ala Met His Gly Val Trp Arg Tyr Trp Ala Pro Pro
 180 185 190

Met Glu Arg Ser Lys Leu Ala Thr Thr Ala Phe Thr Gly Ser Tyr Ala
 195 200 205

Gly Ala Val Leu Gly Leu Pro Leu Ser Ala Phe Leu Val Ser Tyr Val
 210 215 220

Ser Trp Ala Ala Pro Phe Tyr Leu Tyr Gly Val Cys Gly Val Ile Trp
 225 230 235 240

Ala Ile Leu Trp Phe Cys Val Thr Phe Glu Lys Pro Ala Phe His Pro
 245 250 255
 Thr Ile Ser Gln Glu Glu Lys Ile Phe Ile Glu Asp Ala Ile Gly His
 260 265 270
 Val Ser Asn Thr His Pro Thr Ile Arg Ser Ile Pro Trp Lys Ala Ile
 275 280 285
 Val Thr Ser Lys Pro Val Trp Ala Ile Ile Val Ala Asn Phe Ala Arg
 290 295 300
 Ser Trp Thr Phe Tyr Leu Leu Leu Gln Asn Gln Leu Thr Tyr Met Lys
 305 310 315 320
 Glu Ala Leu Gly Met Lys Ile Ala Asp Ser Gly Leu Leu Ala Ala Ile
 325 330 335
 Pro His Leu Val Met Gly Cys Val Val Leu Met Gly Gly Gln Leu Ala
 340 345 350
 Asp Tyr Leu Arg Ser Asn Lys Ile Leu Ser Thr Thr Ala Val Arg Lys
 355 360 365
 Ile Phe Asn Cys Gly Gly Phe Gly Gly Glu Ala Ala Phe Met Leu Ile
 370 375 380
 Val Ala Tyr Thr Thr Ser Asp Thr Thr Ala Ile Met Ala Leu Ile Ala
 385 390 395 400
 Ala Val Gly Met Ser Gly Phe Ala Ile Ser Gly Phe Asn Val Asn His
 405 410 415
 Leu Asp Ile Ala Pro Arg Tyr Ala Ala Ile Leu Met Gly Phe Ser Asn
 420 425 430
 Gly Ile Gly Thr Leu Ala Gly Leu Thr Cys Pro Phe Val Thr Glu Ala
 435 440 445
 Phe Thr Ala His Ser Lys His Gly Trp Thr Ser Val Phe Leu Leu Ala
 450 455 460
 Ser Leu Ile His Phe Thr Gly Val Thr Phe Tyr Ala Val Tyr Ala Ser
 465 470 475 480
 Gly Glu Leu Gln Glu Trp Ala Glu Pro Lys Glu Glu Glu Glu Trp Ser
 485 490 495
 Asn Lys Glu Leu Val Asn Lys Thr Gly Ile Asn Gly Thr Gly Tyr Gly
 500 505 510
 Ala Ala Glu Thr Thr Phe Thr Gln Leu Pro Ala Gly Val Asp Ser Ser
 515 520 525
 Tyr Gln Ala Gln Ala Ala Pro Ala Pro Gly Thr Asn Pro Phe Ala Ser
 530 535 540

Ala Trp Asp Glu His Gly Ser Ser Gly Val Val Glu Asn Pro His Tyr
 545 550 555 560

Gln Gln Trp

<210> 7
 <211> 495
 <212> PRT
 <213> Homo sapiens

<400> 7

Met Arg Ser Pro Val Arg Asp Leu Ala Arg Asn Asp Gly Glu Glu Ser
 1 5 10 15

Thr Asp Arg Thr Pro Leu Leu Pro Gly Ala Pro Arg Ala Glu Ala Ala
 20 25 30

Pro Val Cys Cys Ser Ala Arg Tyr Asn Leu Ala Ile Leu Ala Phe Phe
 35 40 45

Gly Phe Phe Ile Val Tyr Ala Leu Arg Val Asn Leu Ser Val Ala Leu
 50 55 60

Val Asp Met Val Asp Ser Asn Thr Thr Leu Glu Asp Asn Arg Thr Ser
 65 70 75 80

Lys Ala Cys Pro Glu His Ser Ala Pro Ile Lys Val His His Asn Gln
 85 90 95

Thr Gly Lys Lys Tyr Gln Trp Asp Ala Glu Thr Gln Gly Trp Ile Leu
 100 105 110

Gly Ser Phe Phe Tyr Gly Tyr Ile Ile Thr Gln Ile Pro Gly Gly Tyr
 115 120 125

Val Ala Ser Lys Ile Gly Gly Lys Met Leu Leu Gly Phe Gly Ile Leu
 130 135 140

Gly Thr Ala Val Leu Thr Leu Phe Thr Pro Ile Ala Ala Asp Leu Gly
 145 150 155 160

Val Gly Pro Leu Ile Val Leu Arg Ala Leu Glu Gly Leu Gly Glu Gly
 165 170 175

Val Thr Phe Pro Ala Met His Ala Met Trp Ser Ser Trp Ala Pro Pro
 180 185 190

Leu Glu Arg Ser Lys Leu Leu Ser Ile Ser Tyr Ala Gly Ala Gln Leu
 195 200 205

Gly Thr Val Ile Ser Leu Pro Leu Ser Gly Ile Ile Cys Tyr Tyr Met
 210 215 220

Asn Trp Thr Tyr Val Phe Tyr Phe Phe Gly Thr Ile Gly Ile Phe Trp
 225 230 235 240
 Phe Leu Leu Trp Ile Trp Leu Val Ser Asp Thr Pro Gln Lys His Lys
 245 250 255
 Arg Ile Ser His Tyr Glu Lys Glu Tyr Ile Leu Ser Ser Leu Arg Asn
 260 265 270
 Gln Leu Ser Ser Gln Lys Ser Val Pro Trp Val Pro Ile Leu Lys Ser
 275 280 285
 Leu Pro Leu Trp Ala Ile Val Val Ala His Phe Ser Tyr Asn Trp Thr
 290 295 300
 Phe Tyr Thr Leu Leu Thr Leu Leu Pro Thr Tyr Met Lys Glu Ile Leu
 305 310 315 320
 Arg Phe Asn Val Gln Glu Asn Gly Phe Leu Ser Ser Leu Pro Tyr Leu
 325 330 335
 Gly Ser Trp Leu Cys Met Ile Leu Ser Gly Gln Ala Ala Asp Asn Leu
 340 345 350
 Arg Ala Lys Trp Asn Phe Ser Thr Leu Cys Val Arg Arg Ile Phe Ser
 355 360 365
 Leu Ile Gly Met Ile Gly Pro Ala Val Phe Leu Val Ala Ala Gly Phe
 370 375 380
 Ile Gly Cys Asp Tyr Ser Leu Ala Val Ala Phe Leu Thr Ile Ser Thr
 385 390 395 400
 Thr Leu Gly Gly Phe Cys Ser Ser Gly Phe Ser Ile Asn His Leu Asp
 405 410 415
 Ile Ala Pro Ser Tyr Ala Gly Ile Leu Leu Gly Ile Thr Asn Thr Phe
 420 425 430
 Ala Thr Ile Pro Gly Met Val Gly Pro Val Ile Ala Lys Ser Leu Thr
 435 440 445
 Pro Asp Asn Thr Val Gly Glu Trp Gln Thr Val Phe Tyr Ile Ala Ala
 450 455 460
 Ala Ile Asn Val Phe Gly Ala Ile Phe Phe Thr Leu Phe Ala Lys Gly
 465 470 475 480
 Glu Val Gln Asn Trp Ala Leu Asn Asp His His Gly His Arg His
 485 490 495

<210> 8
 <211> 465
 <212> PRT
 <213> Rattus norvegicus

<400> 8

Met Glu Asn Arg Cys Leu Pro Lys Lys Val Pro Gly Phe Cys Ser Phe
1 5 10 15
Arg Tyr Gly Leu Ala Ile Leu Leu His Phe Cys Asn Ile Val Ile Met
20 25 30
Ala Gln Arg Val Cys Leu Asn Leu Thr Met Val Ala Met Val Asn Lys
35 40 45
Thr Glu Pro Pro His Leu Ser Asn Lys Ser Val Ala Glu Met Leu Asp
50 55 60
Asn Val Lys Asn Pro Val His Ser Trp Ser Leu Asp Ile Gln Gly Leu
65 70 75 80
Val Leu Ser Ser Val Phe Leu Gly Met Val Val Ile Gln Val Pro Val
85 90 95
Gly Tyr Leu Ser Gly Ala Tyr Pro Met Glu Lys Ile Ile Gly Ser Ser
100 105 110
Leu Phe Leu Ser Ser Val Leu Ser Leu Leu Ile Pro Pro Ala Ala Gln
115 120 125
Val Gly Ala Ala Leu Val Ile Val Cys Arg Val Leu Gln Gly Ile Ala
130 135 140
Gln Gly Ala Val Ser Thr Gly Gln His Gly Ile Trp Val Lys Trp Ala
145 150 155 160
Pro Pro Leu Glu Arg Gly Arg Leu Thr Ser Met Thr Leu Ser Gly Phe
165 170 175
Val Met Gly Pro Phe Ile Ala Leu Leu Val Ser Gly Phe Ile Cys Asp
180 185 190
Leu Leu Gly Trp Pro Met Val Phe Tyr Ile Phe Gly Ile Val Gly Cys
195 200 205
Val Leu Ser Leu Phe Trp Phe Ile Leu Leu Phe Asp Asp Pro Asn Asn
210 215 220
His Pro Tyr Met Ser Ser Ser Glu Lys Asp Tyr Ile Thr Ser Ser Leu
225 230 235 240
Met Gln Gln Val His Ser Gly Arg Gln Ser Leu Pro Ile Lys Ala Met
245 250 255
Leu Lys Ser Leu Pro Leu Trp Ala Ile Ile Leu Asn Ser Phe Ala Phe
260 265 270
Ile Trp Ser Asn Asn Leu Leu Val Thr Tyr Thr Pro Thr Phe Ile Ser
275 280 285

Thr Thr Leu His Val Asn Val Arg Glu Asn Gly Leu Leu Ser Ser Leu
 290 295 300
 Pro Tyr Leu Leu Ala Tyr Ile Cys Gly Ile Val Ala Gly Gln Met Ser
 305 310 315 320
 Asp Phe Leu Leu Ser Arg Lys Ile Phe Ser Val Val Ala Val Arg Lys
 325 330 335
 Leu Phe Thr Thr Leu Gly Ile Phe Cys Pro Val Ile Phe Val Val Cys
 340 345 350
 Leu Leu Tyr Leu Ser Tyr Asn Phe Tyr Ser Thr Val Ile Phe Leu Thr
 355 360 365
 Leu Ala Asn Ser Thr Leu Ser Phe Ser Phe Cys Gly Gln Leu Ile Asn
 370 375 380
 Ala Leu Asp Ile Ala Pro Arg Tyr Tyr Gly Phe Leu Lys Ala Val Thr
 385 390 395 400
 Ala Leu Ile Gly Ile Phe Gly Gly Leu Ile Ser Ser Thr Leu Ala Gly
 405 410 415
 Leu Ile Leu Asn Gln Asp Pro Glu Tyr Ala Trp His Lys Asn Phe Phe
 420 425 430
 Leu Met Ala Gly Ile Asn Val Thr Cys Leu Ala Phe Tyr Leu Leu Phe
 435 440 445
 Ala Lys Gly Asp Ile Gln Asp Trp Ala Lys Glu Thr Lys Thr Thr Arg
 450 455 460

Leu
 465

<210> 9
 <211> 14
 <212> RNA
 <213> Artificial

<220>
 <223> hairpin ribozyme

<220>
 <221> misc_feature
 <222> (4)..(4)
 <223> b is g, c, or u

<220>
 <221> misc_feature
 <222> (9)..(14)
 <223> b is g, c, or u

<220>
<221> misc_feature
<222> (1)..(3)
<223> n is a, g, c, or u

<220>
<221> misc_feature
<222> (5)..(5)
<223> n is a, g, c, or u

<400> 9
nnnbngucnn nnnn

14

<210> 10
<211> 32
<212> DNA
<213> Artificial

<220>
<223> PCR primer

<400> 10
gggaattcat tcatgaagat gaactggatg aa

32

<210> 11
<211> 32
<212> DNA
<213> Artificial

<220>
<223> PCR primer

<400> 11
ggctcgagct agcttcgtta tgaataatca tc

32